

AMENDMENTS TO THE CLAIMS

1. **(Currently Amended)** A golf club head satisfying the following three conditions in a moment  $M$  of inertia around a center line of a shaft axis ( $\text{g} \cdot \text{cm}^2$ ) and a depth  $L$  of center of gravity (mm):

(1)  $4000 \leq M \leq 7000$ ;

(2)  $30 \leq L \leq 50$ ; and

~~(3)  $M \leq 200 \times L - 2000$ .~~ (3)  $M \leq (200 \times L) - 2000$ .

2. **(Currently Amended)** The golf club head according to claim 1, further satisfying the following two conditions:

~~(4)  $M \leq 200 \times L - 2390$ ; and~~ (4)  $M \leq (200 \times L) - 2390$ ; and

~~(5)  $M \geq 200 \times L - 4500$ .~~ (5)  $M \geq (200 \times L) - 4500$ .

3. **(Original)** The golf club head according to claim 1, further satisfying the following condition:

(6)  $4420 \leq M \leq 6500$ .

4. **(Original)** The golf club head according to claim 1, further satisfying the following condition:

(7)  $4600 \leq M \leq 6000$ .

5. (Original) The golf club head according to claim 1, further satisfying the following condition:

$$(8) 34 \leq L \leq 45.$$

6. (Original) The golf club head according to claim 1, further satisfying the following condition:

$$(9) 37 \leq L \leq 42.$$

7. (Currently Amended) The golf club head according to claim 1, further satisfying the following two conditions:

$$(10) M \leq 200 \times L - 2050; \text{ and } (10) M \leq (200 \times L) - 2050; \text{ and}$$

$$(11) M \geq 200 \times L - 5000; (11) M \geq (200 \times L) - 5000.$$

8. (Currently Amended) The golf club head according to claim 1, further satisfying the following two conditions:

$$(12) M \leq 200 \times L - 3450; \text{ and } (12) M \leq (200 \times L) - 3450; \text{ and}$$

$$(13) M \geq 200 \times L - 4500; (13) M \geq (200 \times L) - 4500.$$

9. (Currently Amended) The golf club head according to claim 1, ~~comprising:~~  
wherein said head comprises:

a face portion forming a hitting face hitting a ball;

a crown portion extending from an upper edge of the hitting face and forming an upper surface of the head;

a sole portion extending from a lower edge of the hitting face and forming a bottom surface of the head;

a side portion extending between the crown portion and the sole portion from a toe side edge of the hitting face to a heel side edge of the hitting face through a back face; and

a neck portion formed with a shaft insertion hole to which one end of a shaft is attached, wherein

in a measuring state where an axial center line of the shaft insertion hole is arranged in a vertical plane and is inclined at a lie angle  $\beta$  determined in accordance with the head, and a face angle is set to zero,

a point at which the axial center line of the shaft insertion hole crosses a virtual plane passing through an upper end surface of the neck portion is set to an origin O, and a two-dimensional X-Y coordinate in which a Y-axis is a nodal line between the horizontal plane and the vertical plane, and an X-axis is an axis line passing through the

origin O and being perpendicular to the Y-axis is virtually set on the horizontal plane passing through the origin O, and

in the case where the maximum value of the Y-axis in a profile line of the head projected on the X-Y coordinate system is set to  $y_m$  and the maximum value of the X-axis is set to  $x_m$ , a weight member having a great specific gravity is firmly attached to the sole portion in an area where a center of gravity of the weight member is set to 0.2 to 0.7 times of the  $x_m$  value in the X-coordinate and set to 0.1 to 0.5 times of the  $y_m$  value in the ~~Y-coordinate~~. Y-coordinate,

wherein the specific gravity is in the range of from 6.0 to 25.0, and

the weight member is mounted in a concave portion formed on the sole portion.

10. **(Withdrawn)** The golf club head according to claim 1, comprising:
- a face portion forming a hitting face hitting a ball;
  - a crown portion extending from an upper edge of the hitting face and forming an upper surface of the head;
  - a sole portion extending from a lower edge of the hitting face and forming a bottom surface of the head;
  - a side portion extending between the crown portion and the sole portion from a toe side edge of the hitting face to a heel side edge of the hitting face through a back face; and

a neck portion formed with a shaft insertion hole to which one end of a shaft is attached, wherein

in a measuring state where an axial center line of the shaft insertion hole is arranged in a vertical plane and is inclined at a lie angle  $\beta$  determined in accordance with the head, and a face angle is set to zero,

a point at which the axial center line of the shaft insertion hole crosses a virtual plane passing through an upper end surface of the neck portion is set to an origin O, and a two-dimensional X-Y coordinate in which a Y-axis is a nodal line between the horizontal plane and the vertical plane, and an X-axis is an axis line passing through the origin O and being perpendicular to the Y-axis is virtually set on the horizontal plane passing through the origin O, and

in the case where the maximum value of the Y-axis in a profile line of the head projected on the X-Y coordinate system is set to  $y_m$  and the maximum value of the X-axis is set to  $x_m$ , a thick portion having a greater thickness than the other portions is provided in the sole portion corresponding to an area where the X-coordinate is 0.2 to 0.7 times of the  $x_m$  value and the Y-coordinate is 0.1 to 0.5 times of the  $y_m$  value.

11. **(Withdrawn)** The golf club head according to claim 1, comprising:  
a face portion forming a hitting face hitting a ball;

a crown portion extending from an upper edge of the hitting face and forming an upper surface of the head;

a sole portion extending from a lower edge of the hitting face and forming a bottom surface of the head;

a side portion extending between the crown portion and the sole portion from a toe side edge of the hitting face to a heel side edge of the hitting face through a back face; and

a neck portion formed with a shaft insertion hole to which one end of a shaft is attached, wherein

in a measuring state where an axial center line of the shaft insertion hole is arranged in a vertical plane and is inclined at a lie angle  $\beta$  determined in accordance with the head, and a face angle is set to zero,

a point at which the axial center line of the shaft insertion hole crosses a virtual plane passing through an upper end surface of the neck portion is set to an origin O, and a two-dimensional X-Y coordinate in which a Y-axis is a nodal line between the horizontal plane and the vertical plane and an X-axis is an axis line passing through the origin O and being perpendicular to the Y-axis is virtually set on the horizontal plane passing through the origin O, and

in the case where the maximum value of the Y-axis in a profile line of the head projected on the X-Y coordinate system is set to  $y_m$  and the maximum value of the X-

axis is set to  $x_m$ , a thin portion having a smaller thickness than the other portions is provided in the sole portion corresponding to an area where the X-coordinate is equal to or less than 0.6 times of the  $x_m$  value and the Y-coordinate is equal to or more than 0.4 times of the  $y_m$  value.

12. (Withdrawn) The golf club head according to claim 1, comprising:
- a face portion forming a hitting face hitting a ball;
  - a crown portion extending from an upper edge of the hitting face and forming an upper surface of the head;
  - a sole portion extending from a lower edge of the hitting face and forming a bottom surface of the head;
  - a side portion extending between the crown portion and the sole portion from a toe side edge of the hitting face to a heel side edge of the hitting face through a back face; and
  - a neck portion formed with a shaft insertion hole to which one end of a shaft is attached, wherein
- in a measuring state where an axial center line of the shaft insertion hole is arranged in a vertical plane and is inclined at a lie angle  $\beta$  determined in accordance with the head, and a face angle is set to zero,

a point at which the axial center line of the shaft insertion hole crosses a virtual plane passing through an upper end surface of the neck portion is set to an origin O, and a two-dimensional X-Y coordinate in which a Y-axis is a nodal line between the horizontal plane and the vertical plane and an X-axis is an axis line passing through the origin O and being perpendicular to the Y-axis is virtually set on the horizontal plane passing through the origin O, and

in the case where the maximum value of the Y-axis in a profile line of the head projected on the X-Y coordinate system is set to  $y_m$  and the maximum value of the X-axis is set to  $x_m$ , a wavy portion having an increased surface area by an alternative connection between concave portions and convex portions is provided in the sole portion corresponding to an area where the X-coordinate is 0.2 to 0.7 times of the  $x_m$  value and the Y-coordinate is 0.1 to 0.5 times of the  $y_m$  value.

13. (New) The golf club head according to the claim 9, wherein the concave portion has a thickness larger than other portions in the sole portion.

14. (New) The golf club head according to the claim 9, wherein the concave portion has a bottom in contact with the weight member.



Application No.: 10/725,458

Docket No.: 0229-0782P

Art Unit 3711

Reply to Office Action of February 8, 2005

15. (New) The golf club head according to the claim 9, wherein the weight member is mounted in the concave portion by plastically deforming the concave portion or the weight member itself.

16. (New) The golf club head according to the claim 9, wherein the weight member has a mass of 5% to 15% of the entire mass of the head.

o